

## **Does Organizational Support Affect Employees' Commitment to Implement Biogas Programs?**

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### **ABSTRACT**

The stakeholders must support the important process of generating renewable energy. One source of renewable energy is biogas produced from palm oil liquid waste. The organizations and employees' support are expected to succeed biogas program and to generate the renewable energy. This research investigates organizational support and employees' commitment in implementing biogas programs. The research was conducted in PTPN III Region of North Sumatera with a sample of 98 employees in eight areas proportionally. The explorative research aims to predict the effect of organizational support and employee's commitment in implementing biogas program. The results show that the organizational support and employees' commitment have either direct or indirect influence on biogas program. In conclusion, the biogas program needs organizational support and increased employees' commitment so that it can be implemented in accordance with the intended purpose.

**Keywords:** Organizational Support, Commitment, Biogas, Renewable Energy

**JEL Classifications:** O13, O14, O15

### **1. INTRODUCTION**

Over the years, the oil palm plantation in Indonesia shows an immense growth. The development of palm oil export commodities continues to increase from year to year with an average growth rate of 7.67% during 2004-2014. As a result, the palm oil production increased by an average of 11.09% per annum (Perkebunan, 2014). The development within this area is driven by CPO prices that are relatively stable in the international market. Moreover, it provides producers income, particularly for the farmers who are quite profitable (Sumathi et al., 2008).

The area of oil palm reaches 10.9 million ha with a production of 29.3 million tons of CPO. The width of the plantation area is 4.55 million ha or 41.55% of the total area. PTPN owns 0.75 million ha or 6.83% of the total area while the width of private property is 5.66 million ha or 51.62%. The private sector is divided into two group. The first is the foreign private sector with 0.17 million ha or 1.54% and the rest is local sector (Perkebunan, 2014).

To increase the value of oil palm plantations, Private plantations and State Owned Enterprises of production fresh fruit bunches

(FFB) are processed at palm oil mills (POM) to produce crude palm oil and kernel oil products. The number of POM has reached 608 units with installed capacity of 34,280 tons FFB/h (Perkebunan, 2014). This fact shows the rapid development of the palm oil industry in Indonesia and the potential selling value of main products and the byproducts.

Besides producing oil palm, kernel can produce sideline products such as fiber, shell, empty land and liquid waste. According to King and Yu (2013), FFB can produce palm oil liquid waste of 0.65 m<sup>3</sup>/ton of FFB. The POM effluent can produce biogas with the main content of methane (CH<sub>4</sub>) of 55-70% and carbon dioxide (CO<sub>2</sub>) of 30-45% and a small amount of nitrogen and hydrogen sulfide. If the methane gas in biogas is more than 50%, the biogas is suitable as fuel.

The biogas can be used as a power plant electric potential by using Covered Lagoon technology. It will produce biogas as much as ±20 m<sup>3</sup>/ton FFB. Therefore, the MCC capacity of 30-ton FFB/h will produce biogas ±600 m<sup>3</sup>/h, equal to 5.044 MJ/h, or 3.720 kWh of energy. If the energy is used to generate electricity using a gas engine with an efficiency of 35%, it will be able to generate electricity of 1.303 kWh or 1.3 MW (Safrizal, 2015).

Assuming the power plant that operates for 300 days/year in 24 h/day with the price set Rp. 975/kWh (Permen ESDM, 2012), then it means Sumatra has a potential income of Rp. 9.15 Billion/year (Safrizal, 2015). One of the efforts to increase the added value to the company plantations is biogas from POM waste. Apart from being a source of electrical energy, the utilization of biogas can also reduce greenhouse gas effects, reduce wastewater treatment and reduce negative impacts to the surrounding environment.

PTPN III is one of the state-owned enterprises engaged in oil palm plantations with an area of oil palm plantations of 96,445.75 ha, managing 12 units of POM with an installed capacity of 555 tons of FFB/h. This has enormous potential for the utilization of POM waste into biogas. Utilizing biogas is also one form of environmental responsibility and conservation of natural wealth and biodiversity. The palm oil wastes can be utilized in some ways that are environmentally responsible, energy efficient and maximum use of renewable energy.

By the end of 2014, the electricity consumption in North Sumatra reaches approximately 12,150 GWh with consumption per user sector for households 4243 GWh (34.9%), business 1,252 GWh (10.3%), industrial 5906 GWh (48.6%) and public 748 GWh (6.2%). The electrification ratio in 2014 is 91.03%. Furthermore, the electrification ratio is expected to increase from 93.15% in 2015 to 100% by 2021. To achieve this goal, an average number of electric households is expected to increase around 77,077 households per year. Meanwhile, to maintain 100% electrification ratio by 2034, an average growth in the number of households is estimated to be 21,319 households per year. The demand for electricity is projected to grow by an average of 4.5% per year over the next 10 years or about 4.8% per year for the next 20 years. Therefore, the estimated power demand of 12,591 GWh in 2015 will increase to 18,763 GWh in 2024 and 30,679 GWh in 2034 (RUKN, 2016).

To meet the electricity demand for the next 10 years, the additional needed capacity is around 245 MW per year, while for the next 20 years approximately 288 MW per year. With the addition of such capacity, electricity supply will increase from 3126 MW in 2015 to 4595 MW in 2024 and 7398 MW by 2034. The tug of the electricity supply can come from the additional power plant in North Sumatra itself as well as power transfer from another area through the distribution system (RUKN, 2016).

Until 2014 the total installed capacity of existing power plants in North Sumatra is about 2,922 MW. It consists of 2,074 IPPs government generators with 245 MW and non-fuel IO 603 MW. Based on the type, the installed capacity of the plant consists of approximately 923 MW PLTA, 230 MW coal-fired power plant, 260 MW oil/gas steam power plant, 30 MW of biomass power plant, 234 MW of steam power plant, 818 MW of steam power plant, PLTP 12 MW, PLTD 344 MW, PLTMG 50 MW, and PLTM 23 MW. Non-oil BB IO consists of power plants owned by PT Inalum (RUKN, 2016).

The organizational support is important so that the program works well. Organizational support is needed in order to guarantee the

course of the established biogas production program. It needs support from all members of the organization, because it is one of the intangible resources. Sidharta and Affandi (2016) states that an intangible resource has play an important role in improving the organizational performance. The organizational support enables the program to be implemented effectively and efficiently.

Organizational support is seen as a crucial aspect since it has a connection with the behavior of its workers. The organization has an obligation to create a climate that can support organizational goals. Bateman and Snell (2015) believe that organizational and management support will enhance the orientation behavior of their workers. Kreitner and Kinicki (2014) argue that individuals are interested and feel comfortable in the organization due to the similar characteristics among them. Robbins and Judge (2015) state that individuals who share the same values with the organization will easily interact with the organizational value system. The situation reduces uncertainty and conflict, increase satisfaction and improve performance.

The results of meta-analysis performed by Rhoades and Eisenberger (2006) prove that organizational support is closely related to employee performance. This is reinforced by Niehoff (Chiang and Hsieh, 2012) who states if the employees feel appreciated they will give high morale. The results of research conducted by Chiang and Hsieh (2012) of 513 hotel employees in Taiwan prove that organizational support has a significant effect on employees' performance. The results indicate that organizational support can create the employees' desire to implement organizational goals.

Many issues are associated with organizational support. When organizational support stimulates achievement and provides a way for satisfying the workers' important needs, then the contribution of organizational support for performance is expected to be large enough. It is a reasonable desire of each employee to pursue the best career. In this case, the employee desires to reach the highest position in the level of employment. It happens since many employees still assume when they earn the position, they will also obtain the fortune. To create the employee welfare, it is necessary to create opportunities to improve the employee performance that has full support from the organization. Organizational support can be used to improve employee performance. Thus, it can be said that organizational support variable has a positive effect on employee's willingness.

Organizational support comes in the form of appreciation of value, the willingness of the company to help and the company's concern. The positive support from the leader and all employees will create a conducive working environment. The employee performance will work better when they gain some support. In addition, the support also raises the employees' team spirit so that they can trust and help each other. Moreover, there will be a good relationship between workers in the work environment (Payne and Pheysey, 1971). The result of a meta-analysis study conducted by Riggie et al. (2009) prove that organizational support can increase the commitment of employees in implementing the established organization's program.

This study aims to find out how the effect of organizational support to the commitment of employees in implementing biogas program. Several previous studies have proven that organizational support has an effect on commitment in implementing the established program.

Thus the hypotheses in this research are as follows:

H<sub>1</sub>: Does organizational support affect the implementation of biogas programs?

H<sub>2</sub>: Does the employee's commitment affect the implementation of the biogas program?

H<sub>3</sub>: Does organizational support affect the implementation of biogas programs through employee commitment?

## 2. METHODS

This research uses the survey method. It generalizes the observation about the influence of organization support to employees' commitment to implement biogas program. Survey research is a study conducted on large and small populations. However, the studied data comes from samples taken from the population. Thus, the relative events, distribution, and relationships between sociological and psychological variables are found.

This research was conducted in PTPN III of North Sumatera since it is one of the centers of biogas development program in Indonesia. In establishing the expected development, it requires a model of adequate study in the development of biogas program.

Based on the framework, the variables used to analyze the relationship in this research are: Organizational support, employee commitment, and biogas program implementation. The instruments used in this study adapted from Noble and Mokwa (1999). It consists of 4 indicators developed for the development of organizational support of biogas program and the success of implementation developed on the implementation of biogas program with 5 indicators. Meanwhile, the commitment of employees developed by Mowday et al. (1979) is adjusted for this research. The 4 indicators are: (1) This company really inspires the very best in me, (2) accept any type of job assignment, (3) I find that my values and company's values are very similar, (4) willing to help the company to be successful.

The measurement scale in capturing the research data is entirely measured in 5-point Likert scale. It starts from strongly disagrees to strongly agree. Within this research, data collection is an important step to know the characteristics of the population - the elements in research object. The data is used to take the decision to test the hypothesis. In order to obtain a representative sample of the population, each subject in the population is designed to have the equal opportunity for the sample. The sampling technique used in this study is clustered proportional random sampling, in which the researcher gives the same rights to the respondents to fill out the questionnaire. The number of samples taken is 98 employees who represent 8 areas in PTPN III.

### 2.1. Data Analysis

The results of the overall calculation can be described as shown in Figure 1.

The results of validity and reliability are shown in Tables 1 and 2, while the result of the path of analysis and r square is shown in Table 3. The outer loadings of the research indicator show a value above 0.5 as stated (Chin, 1988). While validity and reliability show results that match the criteria of >0.7. The result of path analysis and R-square shows that P-value is significant <0.5.

## 3. RESULTS

All hypotheses proposed in this study are acceptable with a P < 0.5. The results indicate that the problem is low organizational support. Allegedly it is indicated by the low stimulus perceived by employees. The lack of organizational support is caused by the lack of development opportunities and uncertainty in the overall career path. The employees' commitment will not be optimal. The effort in supporting the organization can contribute to the improvement of employees' commitment. Robbins and Judge (2015) argue that organizational support is related to employees' responses to their

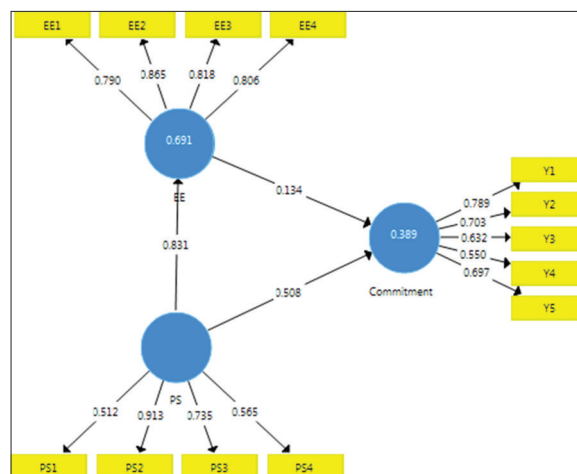
**Table 1: Outer loadings**

Indicators	EE	PS	Commitment
EE1	0.790		
EE2	0.865		
EE3	0.818		
EE4	0.806		
PS1		0.512	
PS2		0.913	
PS3		0.735	
PS4		0.565	
Y1			0.789
Y2			0.703
Y3			0.632
Y4			0.550
Y5			0.679

**Table 2: Construct reliability and validity**

Variables	Cronbach's alpha	Composite reliability	Average variance extracted
EE	0.894	0.893	0.673
PS	0.810	0.784	0.589
Commitment	0.804	0.808	0.561

**Figure 1: Result of research variables**



**Table 3: Path coefficients and R<sup>2</sup>**

Variables	Original sample	t-statistics	Average variance extracted
EE > Commitment	0.134	5.245	0.003
PS > Commitment	0.508	9.257	0.000
PS > EE	0.831	14.123	0.000
R <sup>2</sup>			
Commitment	0.389	3.801	0.005
EE	0.691	6.413	0.000

contribution to the organization and how much organization care about their contribution.

In relation to the long-term plan in the implementation of biogas which has a source of raw material derived from eight FFB with 13,347 ha with production potential above 200,000 tons/year with electricity production. The demand for electricity in North Sumatra is designed to grow by an average of 4.5% per year over the next 10 years or about 4.8% per year for the next 20 years, this can be achieved with support from the organization.

The research conducted by Beintein et al. (2007) proves that organizational support makes employees provide better service that meets the organization goals. Similarly, the study conducted by Eder and Eisenberg (2008) shows that organizational support will reduce the performance that is not expected by the organization. Biogas program in PTPN III is potential due to the availability of raw materials and upstream processing as well that produce biogas byproducts. Moreover, the promising market with optimal organizational support will increase the employee's desire to implement the biogas program.

#### 4. CONCLUSION

Organizational support can increase employee commitment both directly and indirectly to biogas program. This requires serious attention from the organization so that all employees contribute to the implementation of biogas program that can generate renewable energy for electricity needs in North Sumatra. Good cooperation among the stakeholders is expected to support this biogas program. The results of this study only focus on organizational support and employee commitment in implementing biogas program. There are still many flaws within this research. The future studies are expected to examine the role of government and the private sector in implementing biogas programs in order to generate the renewable energy.

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